Space Weather Forecast

Issued on Thursday, 26 October 2023 at 13:28 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

Space Weather Forecast Headline: Chance G1/Minor Storm intervals day 1 and 4 (26 Oct and 29 Oct)

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Low with occasional common class flares, the strongest it which was at 25/2244 UTC from a new sunspot region in the northeast disc. This is one of four regions on the Earth-facing disc however these are all relatively small and simple. The other three regions are in the southwest disc.

No Earth-directed CMEs (coronal mass ejections) have been observed.

Solar Wind / Geomagnetic Activity: The solar wind showed a weak enhancement due to the arrival of a coronal hole fast wind. Solar wind speeds steadily increased from background, near 300km/s, to be slightly elevated around 410 km/s. Interplanetary Magnetic Field (IMF) was initially weak but increased to be Moderate by the end of the period. The north-south component was predominately negative (southward), with a similar increasing trend in magnitude. Geomagnetic activity was Quiet to Unsettled (Kp 0-3) with one Active interval (Kp4) 26/0900-1200 UTC.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) remained at background with no solar radiation storms observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Low activity forecast with occasional common class flares, and a slight chance of isolated Moderate flares.

Solar Wind / Geomagnetic Activity: There are no Earth directed CMEs. Current weak coronal hole sourced fast solar winds are expected to continue day 1-2 (26-27 Oct), likely peaking around 450 km/s, before easing to background. The next enhancement, from the larger coronal holes on the disc, is then expected either late day 4 or just beyond this forecast period (29-30 Oct). Quiet to Unsettled geomagnetic activity is expected day 1 and early day 2 (26-27 Oct) with a chance of Active to G1 Minor Storm intervals. Easing to mainly Quiet with isolated Unsettled spells later day 2 onward. G1/Minor storms are likely when the larger coronal hole winds arrive, however due to the uncertainty with timing, this brings only a chance of these conditions by the end of day 4 (29 Oct).

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is forecast to persist at background with no solar radiation storms occurring.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	30	5	1	30
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	5	10	15	20
Very Active	R3 to R5 X	No	1	1	1	1

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	1	1	1	1
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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